

WHAT IS CLAIMED IS:

- 1 1. A temperature sensing device comprising:
2 a first temperature sensor configured for mounting to a structure at a
3 first distance relative to the structure;
4 a second temperature sensor configured for mounting to the structure at
5 a second distance relative to the structure; and
6 a processor coupled to the first and second temperature sensors and
7 configured to estimate a third temperature based on the first and second temperatures
8 and the distance separating the first and second temperature sensors.
- 1 2. The temperature sensing device of claim 1, wherein the first and
2 second temperature sensors are mounted in a housing.
- 1 3. The temperature sensing device of claim 1, wherein the second
2 distance is greater than the first distance.
- 1 4. The temperature sensing device of claim 1, wherein the third
2 temperature is an estimate of a temperature at a third distance from the structure, the
3 third distance being greater than the first and second distances.
- 1 5. A method of sensing temperatures in a room, comprising:
2 mounting a first temperature sensor to a structure in the room at a first
3 distance relative to the structure;
4 mounting a second temperature sensor to the structure at a second
5 distance relative to the structure;
6 measuring a first temperature with the first temperature sensor;
7 measuring a second temperature with the second temperature sensor;
8 and
9 estimating a third temperature from the first and second temperatures.

1 6. The method of claim 5, further including coupling a processor to the
2 first and second temperature sensors, and wherein the third temperature is calculated
3 by the processor.

1 7. The method of claim 5, wherein the first and second temperature
2 sensors are mounted in a housing.

1 8. The method of claim 5, wherein the processor is mounted in the
2 housing.

1 9. The method of claim 5, wherein the second distance is greater than the
2 first distance.

1 10. The method of claim 5, wherein the third temperature is an estimate of
2 a temperature at a third distance from the structure, the third distance being greater
3 than the first and second distances.

1 11. A temperature sensing device, comprising:
2 a housing;
3 a first temperature sensor mounted within the housing and configured
4 to sense a first temperature;
5 a second temperature sensor mounted within the housing and spaced
6 apart from the first temperature sensor, and configured to sense a second temperature;
7 and
8 a processor coupled to the first temperature sensor and the second
9 temperature sensor and configured to estimate a third temperature using the first
10 temperature and the second temperature.

1 12. The temperature sensing device of claim 11; wherein the first
2 temperature sensor is positioned proximate to a first surface of the housing and the
3 second temperature sensor is positioned proximate to a second surface of the housing
4 spaced apart from the first surface.

1 13. The temperature sensing device of claim 12, wherein the housing is
2 configured to be mounted to a structure of a building such that the first surface is
3 adjacent to a surface of the structure of the building.

1 14. The temperature sensing device of claim 13, wherein the first
2 temperature is the temperature at or near the surface of the structure of the building.

1 15. The temperature sensing device of claim 14, wherein the structure of
2 the building is a wall.

1 16. The temperature sensing device of claim 15, wherein the third
2 temperature is an air temperature of a room including the wall.

1 17. The temperature sensing device of claim 11, wherein the third
2 temperature is estimated from the first temperature and the second temperature using
3 an extrapolation function.

1 18. The temperature sensing device of claim 17, wherein the extrapolation
2 function is a linear extrapolation function.

1 19. The temperature sensing device of claim 17, wherein the extrapolation
2 function is a non-linear extrapolation function.

1 20. The temperature sensing device of claim 17, wherein the extrapolation
2 function includes a correction factor.

1 21. The temperature sensing device of claim 20, wherein the correction
2 factor is based on estimated environmental or structural conditions of a building.

1 22. The temperature sensing device of claim 11, wherein the temperature
2 sensing device is a thermostat configured to be used with a climate control system.

1 23. The temperature sensing device of claim 22, wherein the climate
2 control system is a heating, ventilating, and air conditioning system.

1 24. The temperature sensing device of claim 11, wherein the processor is
2 mounted within the housing.

1 25. A method comprising:
2 measuring a first temperature using a first temperature sensor mounted
3 within a housing;
4 measuring a second temperature using a second temperature sensor
5 mounted within the housing and spaced apart from the first temperature sensor; and
6 estimating a third temperature from the first temperature and the
7 second temperature using a processor coupled to the first temperature sensor and the
8 second temperature sensor.

1 26. The method of claim 25, wherein the third temperature is estimated
2 from the first temperature and the second temperature using an extrapolation function.

1 27. The method of claim 26, wherein the extrapolation function is a linear
2 extrapolation function.

1 28. The method of claim 26, wherein the extrapolation function is a non-
2 linear extrapolation function.

1 29. The method of claim 26, wherein the extrapolation function includes a
2 correction factor.

1 30. The method of claim 29, wherein the correction factor is based on
2 estimated environmental or structural conditions of a building.

1 31. The method of claim 30, wherein the first temperature sensor is
2 positioned proximate to a first surface of the housing and the second temperature
3 sensor is positioned proximate to a second surface of the housing.

1 32. The method of claim 31, wherein the housing is configured to be
2 mounted to a structure of a building such that the first surface is exposed to a surface
3 of the structure of the building.

1 33. The method of claim 32, wherein the first temperature is the
2 temperature at or near the surface of the structure of the building.

1 34. The method of claim 33, wherein the structure of the building is a wall.

1 35. The method of claim 34, wherein the third temperature is an air
2 temperature of a room including the wall.

1 36. A temperature sensing device, comprising:
2 a housing;
3 a first temperature sensing means mounted within the housing and
4 configured to sense a first temperature;
5 a second temperature sensing means mounted within the housing and
6 spaced apart from the first temperature sensing means, and configured to sense a
7 second temperature; and
8 means coupled to the first temperature sensor and the second
9 temperature sensor for estimating a third temperature from the first temperature and
10 the second temperature.

1 37. The temperature sensing device of claim 36, the first temperature
2 sensor is positioned proximate to a first surface of the housing and the second
3 temperature sensor is positioned proximate to a second surface of the housing.

1 38. The temperature sensing device of claim 37, wherein the housing is
2 configured to be mounted to a structure of a building such that the first surface is
3 adjacent to a surface of the structure of the building.

1 39. The temperature sensing device of claim 38, wherein the first
2 temperature is the temperature of the surface of the structure of the building.

1 40. The temperature sensing device of claim 39, wherein the structure of
2 the building is a wall.

1 41. The temperature sensing device of claim 36, wherein the third
2 temperature is an air temperature of a room including the wall.

1 42. The temperature sensing device of claim 36, wherein the temperature
2 sensing device is a thermostat configured to be used with a climate control system.

1 43. The temperature sensing device of claim 43, wherein the climate
2 control system is a heating, ventilating, and air conditioning system.

1 44. A temperature sensing device comprising:
2 a first temperature sensor configured to sense a first temperature;
3 a second temperature sensor spaced apart from the first temperature
4 sensor, and configured to sense a second temperature; and
5 a processor coupled to the first temperature sensor and the second
6 temperature sensor and configured to:
7 estimate a heat transfer rate associated with at least one of the
8 first temperature and the second temperature; and
9 determine an air temperature set point based on the heat
10 transfer rate.